Examples, Practice Problems, Assignment #1
PHIL 422 10 points

The assignment (9-18 below) is due AT THE BEGINNING OF CLASS on Monday, February 1. Late work will not be accepted (this includes those coming late to class). For each of the following, determine whether it is a wff. If not, explain why not. If it is, explain why.

Worked Examples: [Answers in RED]

1.  
(P(a) → (P(b) → P(c)))
1. Rule 0: “P(a),” “P(b),” “P(c)” are wffs
2. Rule 4, Line 1: “(P(b) → P(c))” is a wff
3. Rule 4, Lines 1+2: “(P(a) → (P(b) → P(c)))” is a wff
Answer: WFF!

2. ∀c (A(c) → B(c))
1. Rule 0: “A(c),” “B(c)” are wffs
2. Rule 4, Line 1: “(A(c) → B(c))” is a wff
3. Rule 6, Line 2: “∀c(A(c) → B(c))” is NOT a wff because “c” is not a variable!
Answer: Not a wff!

3.  
(∀x(P(x) → Q(x)) ∧ ∃y(P(y) ↔ R(y)))
1. Rule 0: “P(x),” “Q(x),” “P(y),” “R(y)” are wffs
2. Rule 5, Line 1: “(P(y) ↔ R(y))” is a wff
3. Rule 4, Line 1: “(P(x) → Q(x))” is a wff
4. Rule 7, Line 2: “∃y(P(y) ↔ R(y))” is a wff
5. Rule 8, Line 3: “∀x(P(x) → Q(x))” is a wff
6. Rule 2, Lines 4+5: “(∀x(P(x) → Q(x)) ∧ ∃y(P(y) ↔ R(y)))” is a wff
Answer: WFF!

Practice Problems (Work through these for Wed 1/27. We may do some of them in class.)

4. (P(a) → ∃x(P(x) ∧ R(x)))
5. ∀x(A(x) ∧ (B(x) → C(x) ∧ D(y)))
6. (∀x)(F(x) → G(x))
7. ∃y(E(x) ∧ F(x))
8. ∃x(Ax ∧ ∀x(Fx → Gx))

Assignment (These are what you need to turn in on Monday 2/1)

9. ∀x(F(x) → ∀yH(x,y))
10. ¬ ∀x((F(x) ∧ G(x)) → H(x)))
11. (∀x(F(x) → G(x))) ∨ ∀x(G(x) ∨ H(x)))
12. ¬ ¬ Ex (A(x) ∧ B(x))
13. (P(a) → ∀x(P(x) → Q(x))) → Q(a))
14. ((A(a) ∧ B(b)) → ∀xyz(P(x,y) → Q(y,z)))
15. E(xcellent)
16. ∀xPx ∧ Qx
17. ∃x ∃y ∃z (P(x,y) ∧ P(y,z)) → P(a,b)
18. (P(x) ∧ (P(y) ∨ P(z)))